

INTRODUCTION

This equipment is designed to feed and retract a high pressure hose and nozzle into a tube or pipe while rotating the hose and nozzle to achieve full internal coverage during the cleaning process.

CAUTION: A separate control valve for the high pressure water supply **must** be used in conjunction with the operation of this equipment.

I. PRINCIPLES OF OPERATION

This equipment has three air powered functions controlled by two air logic circuits. The Control Gun (see Fig. I-A) is connected to the unit by a 15 ft. umbilical hose to permit the operator maximum mobility during operation.

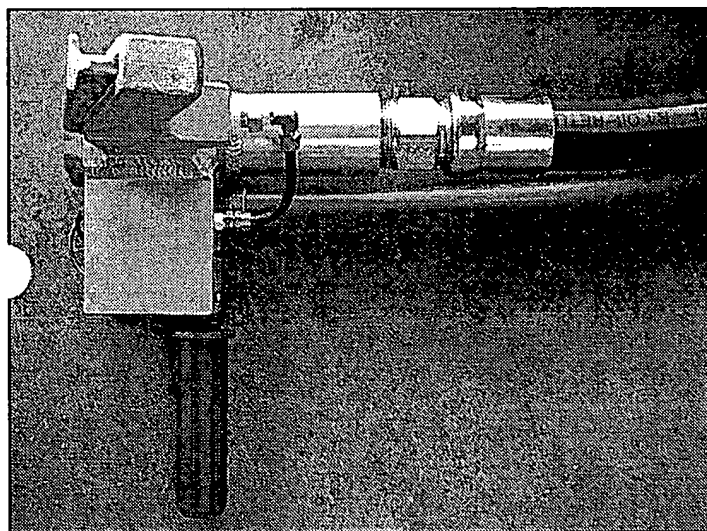


Fig. I-A

The "Rotation" function controls the rotation of the nozzle. The regulators for both functions are mounted on the unit.

The "Extend/Retract" circuit controls the two motors used to extend and retract the hose. The drum motor controls the hose reel and the inch roller motor drives the foam filled tires that push the hose into the tube or pipe being cleaned.

ATTENTION! Synchronization between the drum motor and the pinch roller motor is absolutely required for the **safe** and **effective** operation of this equipment. (See "Set-Up" for details.)

The pinch rollers also assist in retraction of the

hose. However, the reel motor is the primary power source for the "Retract" operation.

The small filter near the primary air supply connection (see Fig. I-B) is for the pilot air (air logic) circuit. Due to the small reservoir on this filter, if air supply permits, it is usually advisable to leave the drain

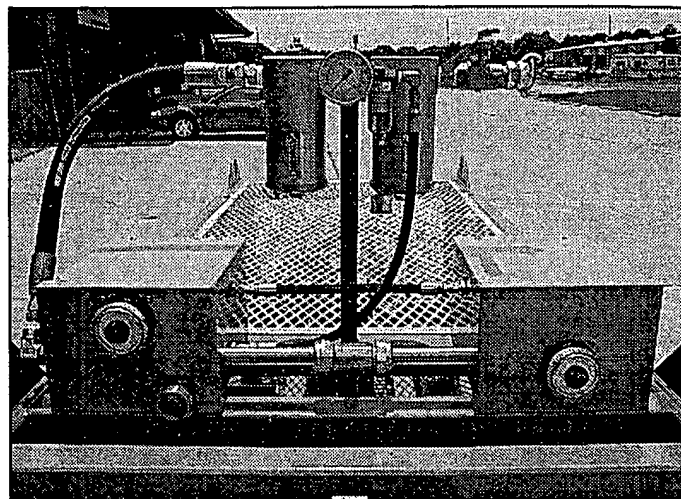


Fig. I-B

partially open during operation so that a "continual purge" is achieved. This pilot air is used to control both the power valves for the motors as well as the piloted (slave) regulators for speed control. The filter for the power circuit is equipped with an automatic drain. However, the sight glasses should be monitored periodically to be sure that the automatic drain is functioning.

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II. SET-UP

After connecting the high pressure water supply (from a control valve) to the inlet swivel, the flexlance nozzle should be removed and the entire system flushed.

After flushing the system, replace the nozzle and pressure test for leaks.

CAUTION!! Never attempt to tighten a connection under pressure. If a leak occurs, dump the system pressure and effect repairs immediately.

Connect main air supply and synchronize pinch roller and drum motors.

NOTE: When the air supply for this equipment varies (either from one job to the next or during a job) the synchronization between these motors may need adjustment in order to maintain safe and optimum operation.

The synchronization process is quite simple if the circuit design concept is understood. The flow control valves (3/4 ADJ VALVE) shown on drawing RO-5 are used to slow the speed of their respective motors in order to keep a slight tension on the hose during the extend and retract operations.

As the available air supply and loads change, readjustment of these valves may be necessary.

After the air supply is connected, set the extend/retract regulator to the approximate speed desired for the cleaning operation. While extending the lance, observe the hose between the reel drum and the pinch rollers.

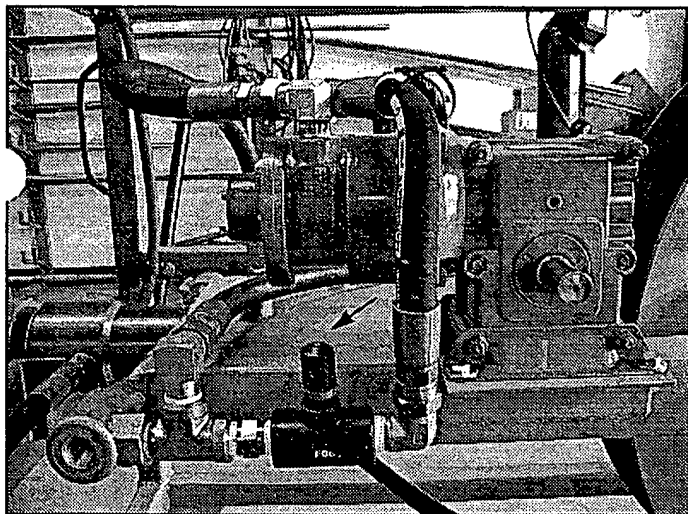


Fig. II-A

The hose should have a slight amount of tension during operation. If the hose is not being slightly pulled off the reel, the flow control to the drum motor (Fig. II-A) should be closed slightly (turn clockwise) to reduce the drum motor speed. Conversely, if the hose seems overly taut, the valve should be opened (turn counter-clockwise) slightly.

NOTE: Adjustment in small increments until the condition is reversed and a 1/4 turn back in the opposite direction will usually produce the desired results.

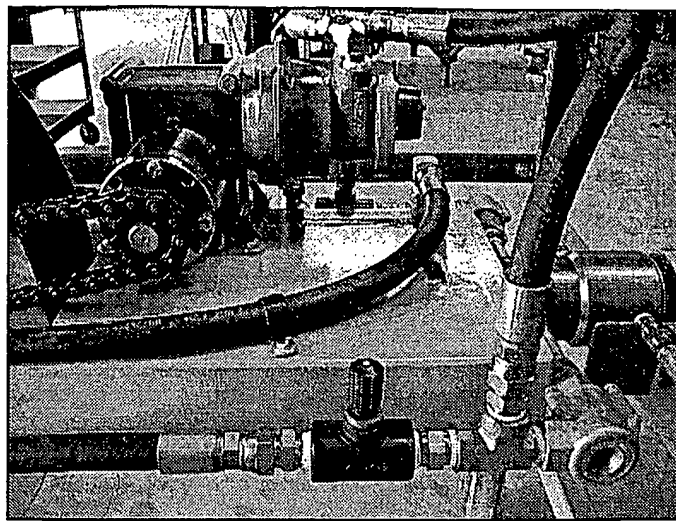


Fig. II-B

After the extend function is adjusted, observe the hose during retraction. If the pinch rollers are retracting the hose faster than the drum is rolling it on, slightly close the valve (Fig II-B) that controls air flow to the pinch roller motor. If the tension seems excessive, opening that valve will increase the pinch roller speed and reduce the load on the load on the drum drive motor.

After the adjustments are made, the unit should be tested again with the rotation motor operating. In conditions where the air supply is marginal, the air consumed by the tumble (rotation) motor may require that additional minor adjustments be made.

III. MAINTENANCE

- 1) Check drip rate and fluid level in lubricators every 3-4 hours. (Use air tool oil or ATF. Do **not** use Marvel Mystery Oil.)
- 2) Maintain swivels per enclosed instruction manuals.
- 3) Grease cradle bearings and drum bearings every 150-200 hours of operation.
- 4) Change gear oil in gear reducers every 1,000 hours.
- 5) Replace o-rings in dual port swivels only as required.

Bill Of Materials

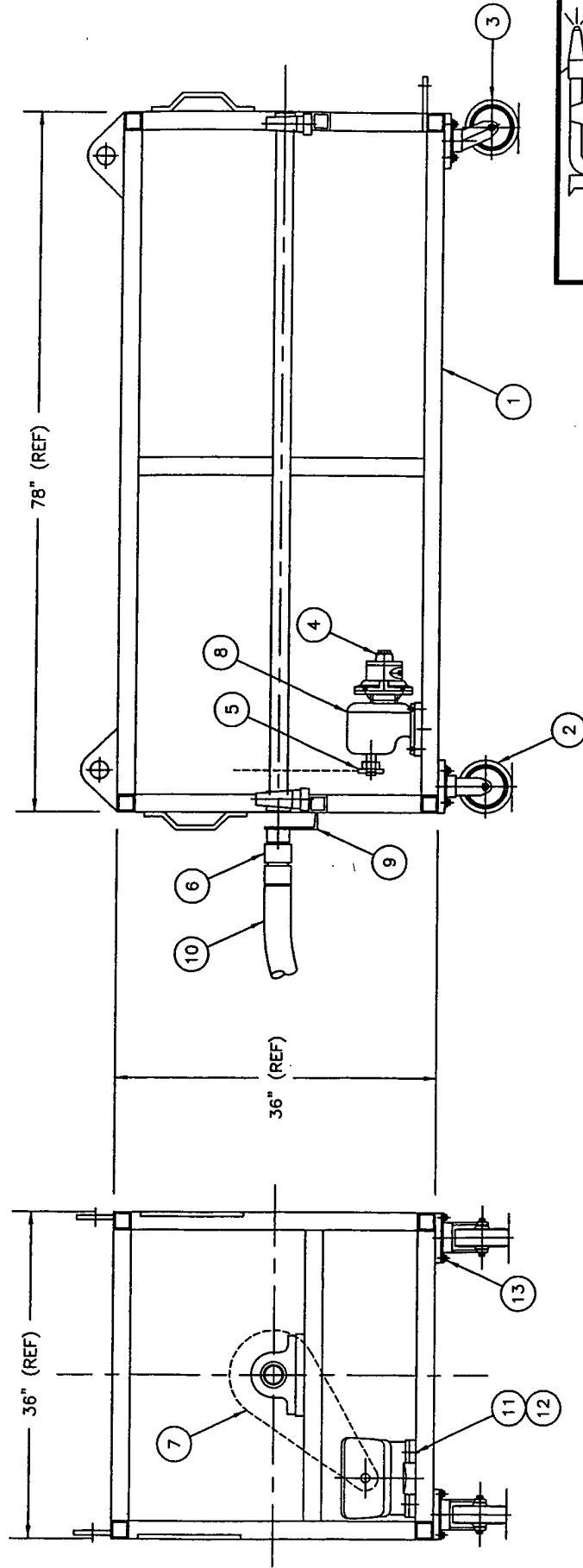
| ITEM # | PCS | QTY | PART NO. | DESCRIPTION | WGT. |
|--------|-----|-----|----------|-------------------------------|------|
| 1 | 1 | 1 | FR783636 | FRAME WELDMENT | |
| 2 | 2 | 2 | CIPE08RG | CASTER POLYURETHANE 8" RIGID | |
| 3 | 2 | 2 | CIPE08SW | CASTER POLYURETHANE 8" SWIVEL | |
| 4 | 1 | 1 | AMG5T4AM | AIR MOTOR GAST 4AM 8 VALVE | |
| 5 | 1 | 1 | SP60BS14 | SPROCKET 60BS14 1" BORE | |

Bill Of Materials

| ITEM # | PCS | QTY | PART NO. | DESCRIPTION | WGT. |
|--------|-----|-----|----------|-------------------------------|------|
| 6 | 1 | 1 | KP24F24M | KAMLOCK 1 1/2" F x 1 1/2" NPT | |
| 7 | 1 | 1 | CHN0060 | CHAIN #60 | |
| 8 | 1 | 1 | WW64Z719 | GEAR REDUCER 12.5:1 C-FACE | |
| 9 | 1 | 1 | RLC00110 | MOUNTING BRACKET GUIDE HOSE | |
| 10 | 1 | 1 | GHC2412X | GUIDE HOSE 1 1/2" x 12' | |

Bill Of Materials

| ITEM # | PCS | QTY | PART NO. | DESCRIPTION | WGT. |
|--------|-----|-----|----------|-------------------------------|------|
| 11 | 4 | 4 | N/A | HH BOLT 3/8-13 UNC x 1 1/4 LG | |
| 12 | 4 | 4 | N/A | LOCK NUT 3/8-13 UNC | |
| 13 | 16 | 16 | N/A | HH BOLT 1/2-13 UNC x 3/4 LG | |



JSA
 JETTING SYSTEMS & ACCESSORIES, INC.
 4026 TREY
 HOUSTON, TEXAS 77084
 ROTARY LINE CLEANER

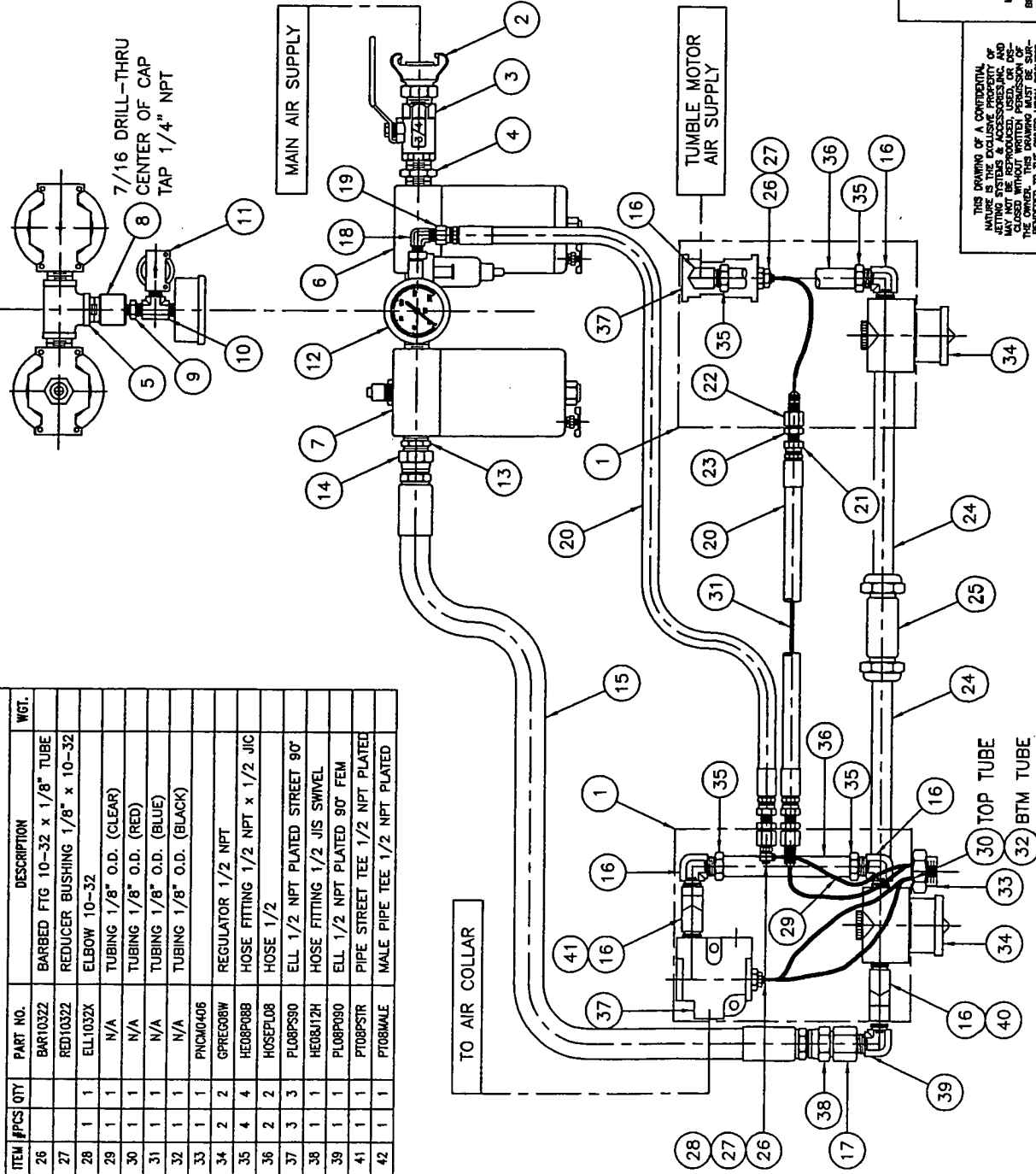
TOLERANCES
 UNLESS OTHERWISE SPECIFIED
 FRACTIONS ±1/64
 DECIMALS ±.005
 ANGLES ±.005
 HOLE DIA. ±.005
 TAP DIA. ±.005
 HOLE DIA. ±.005
 TAP DIA. ±.005
 HOLE DIA. ±.005
 TAP DIA. ±.005

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ENGINE: J.D.F.
 DRAWING NO. FRAM7510
 DATE: 07/28/00
 SCALE: A1:5
 SHEET 1 OF 1
 LCR:FRAM7510 0

Bill Of Materials

| ITEM # | QTY | PART NO. | DESCRIPTION | WGT. |
|--------|-----|----------|--------------------------------|------|
| 26 | | BARI0322 | BARBED FTG 10-32 x 1/8" TUBE | |
| 27 | | REDI0322 | REDUCER BUSHING 1/8" x 10-32 | |
| 28 | 1 | ELL1032X | ELBOW 10-32 | |
| 29 | 1 | N/A | TUBING 1/8" O.D. (CLEAR) | |
| 30 | 1 | N/A | TUBING 1/8" O.D. (RED) | |
| 31 | 1 | N/A | TUBING 1/8" O.D. (BLUE) | |
| 32 | 1 | N/A | TUBING 1/8" O.D. (BLACK) | |
| 33 | 1 | PNCM0406 | REGULATOR 1/2 NPT | |
| 34 | 2 | GPREG08W | HOSE FITTING 1/2 NPT x 1/2 JIC | |
| 35 | 4 | HOEP08B | HOSE 1/2 | |
| 36 | 2 | HOEP10B | ELL 1/2 NPT PLATED STREET 90° | |
| 37 | 3 | PL08PS90 | HOSE FITTING 1/2 JIC SWIVEL | |
| 38 | 1 | HE0812H | ELL 1/2 NPT PLATED 90° FEM | |
| 39 | 1 | PL08P090 | PIPE STREET TEE 1/2 NPT PLATED | |
| 40 | 1 | PT08PSR | MALE PIPE TEE 1/2 NPT PLATED | |
| 41 | 1 | PT08MALE | | |



Bill Of Materials

| ITEM # | QTY | PART NO. | DESCRIPTION | WGT. |
|--------|-----|----------|--|------|
| 1 | 2 | BK100806 | CIRCUIT BOX 10 x 8 x 6 | |
| 2 | 1 | PCF2M00 | CRO-FOOT 3/4" NPT MALE | |
| 3 | 1 | V8B12DR | BALL VALVE 3/4" NPT BRASS | |
| 4 | 3 | PN12PH00 | W/ SAFETY EXHAUST | |
| 5 | 2 | PT12PS00 | HEX NIPPLE 3/4" NPT PLATED | |
| 6 | 1 | GPLT12M | PIPE TEE 3/4" NPT PLATED STEEL | |
| 7 | 1 | GPLUB12M | FILTER 3/4" NPT METAL BOWL | |
| 8 | 1 | PK12SS00 | W/ IMPLUSE DRAIN | |
| 9 | 1 | PS0402PS | LUBRICATOR 3/4" NPT METAL BOWL | |
| 10 | 1 | PT04MBR | CAP 3/4" NPT SS | |
| 11 | 1 | GPLT04P | SWAGE NIPPLE 1/4" NPT x 1/8" NPT | |
| 12 | 1 | G20004RM | MALE BRANCH TEE 1/4" NPT | |
| 13 | 1 | JP121200 | MINI FILTER 1/4" NPT | |
| 14 | 1 | HE1212H | PRESSURE GAUGE 0-200 PSI | |
| 15 | 1 | HOSE0750 | 1/4" NPT REAR MOUNT | |
| 16 | 6 | PL08PS90 | ADP 3/4" NPT x 3/4" JIC STR | |
| 17 | 1 | JP080800 | HOSE FTG 3/4" JIC SWIVEL FOR 3/4" HOSE | |
| 18 | 1 | PL04PS0 | HOSE 3/4" ID HYD/AIR USE | |
| 19 | 1 | HE04P04H | ELL 1/2" NPT PLATED STREET 90° | |
| 20 | 2 | HOSE0250 | ADP 1/2" NPT x 1/2" JIC | |
| 21 | 3 | HE04J04H | PIPE ELL MALE 1/4" NPT PLATED | |
| 22 | 3 | JP04B02F | HOSE FTG 1/4" NPT x 1/4" HOSE | |
| 23 | 3 | JU0404B1 | HOSE 1/4" ID HYD/AIR USE | |
| 24 | 2 | SPB08040 | HOSE FTG 1/4" JIC x 1/4" HOSE | |
| 25 | 1 | RLC00060 | BULKHEAD ADP 1/4 JIC x 1/8" NPT | |
| 26 | 1 | RLC00060 | ADAPTER 1/4" JIC BULKHEAD | |
| 27 | 1 | RLC00060 | PIPE 1/2" SCH 40 304 SS | |
| 28 | 1 | RLC00060 | REPAIR UNION FOR 1/2" PIPE | |

No. REVISION DATE

JSAP
JETTING SYSTEMS & ACCESSORIES, INC.
4026 TREY
HOUSTON, TEXAS 77084
ROTARY LINE CLEANER

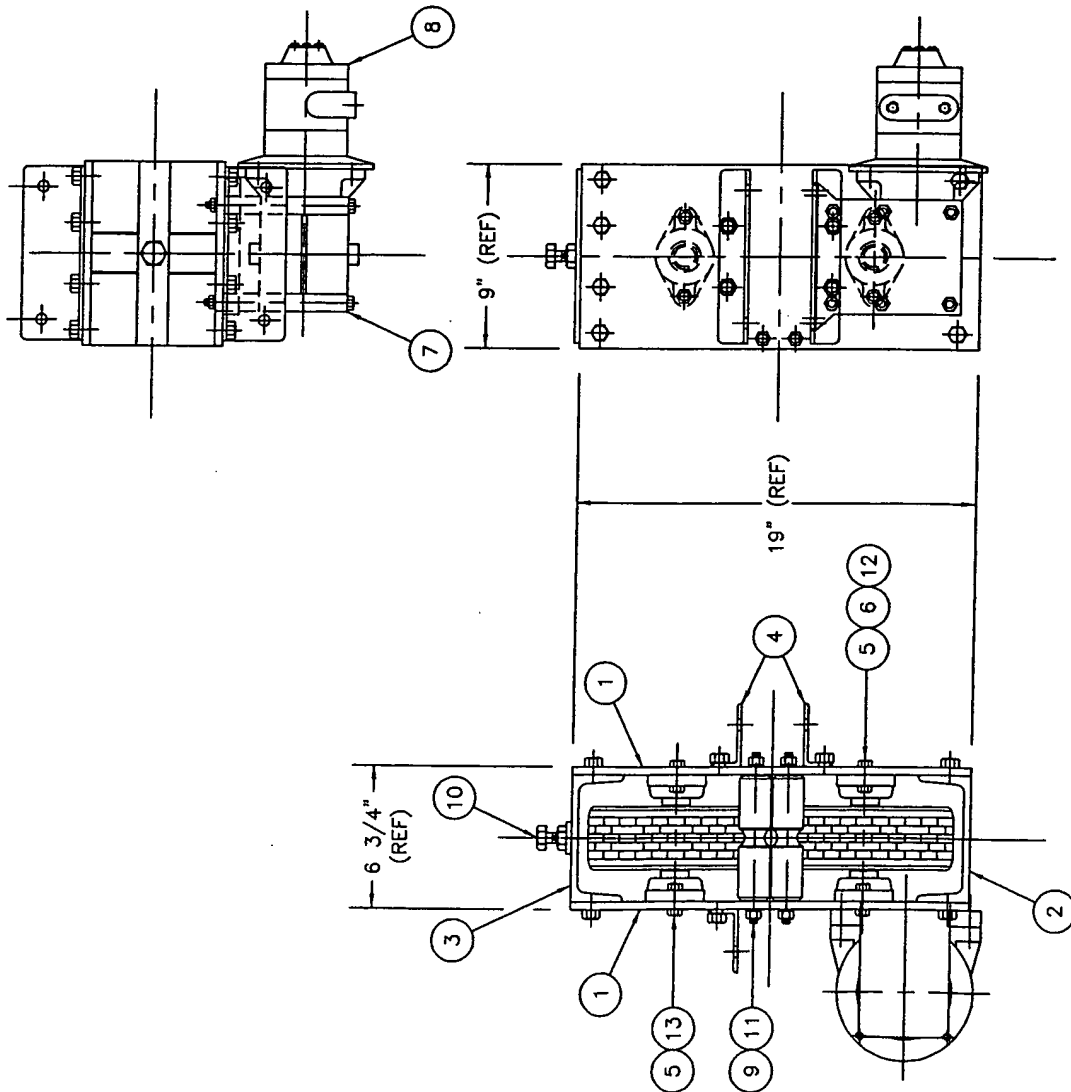
TOLERANCES
UNLESS OTHERWISE SPECIFIED
FRACTIONS DECIMALS
XX DECIMALS
XX DECIMALS
ANGLES ±0°-30'
MACHINED SURFACES L23 / (RMS)
REMOVE ALL BURRS AND
BREAK SHARP EDGES TO R2
DO NOT SCALE

PNEUMATIC ASSEMBLY - 10K RLC
DRAWING NO. PNM7510
DATE 08/01/00
REV. 0

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Bill Of Materials


| ITEM | #PCS | QTY | PART NO. | DESCRIPTION | WGT. |
|------|------|-----|----------|------------------------------|------|
| 1 | 2 | 2 | RLC00044 | PINCH ROLLER PLATE 20/36 | |
| 2 | 1 | 1 | RLC00042 | DRIVE END PLATE PINCH ROLLER | |
| 3 | 1 | 1 | RLC00043 | IDLER END PLATE PINCH ROLLER | |
| 4 | 3 | 3 | RLC00048 | MOUNTING ANGLE | |
| 5 | 3 | 3 | FLNG1000 | FLANGE BEARING 1" 2-BOLT | |
| 6 | 1 | 1 | FLNG1250 | FLANGE BEARING 1 1/4" 2-BOLT | |
| 7 | 1 | 1 | 20GEDA25 | GEAR BOX C-FACE 25:1 | |
| 8 | 1 | 1 | AMGST6AM | AIR MOTOR GAST 6AM 8 VANE | |
| 9 | 2 | 2 | RLC00099 | GUIDE ROLLER - 7/16 RADIUS | |
| 10 | 1 | 1 | RLC00079 | DRIVE TENSIONER BRACKET | |
| 11 | 2 | 2 | RLC00064 | GUIDE ROLLER SHAFT 1/2"-13 | |
| 12 | 1 | 1 | RLC00089 | DRIVE SHAFT / TIRE ASSEMBLY | |
| 13 | 1 | 1 | RLC00120 | IDLER SHAFT / TIRE ASSEMBLY | |
| 14 | | | N/A | LOCK NUT 1/2-13 UNC C.S. | |
| 15 | | | N/A | HH BOLT 1/2-13 UNC | |
| 16 | | | N/A | LOCK NUT 3/8-16 UNC C.S. | |
| 17 | | | N/A | HH BOLT 3/8-16 UNC | |



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UNLESS OTHERWISE SPECIFIED
FRACTIONS ±1/64
X DECIMAL ±0.005
XX DECIMAL ±0.003
XXX DECIMAL ±0.002
ANGLES ±0°-30'

MACHINED SURFACES 125 (RMS)
UNMACHINED SURFACES 250 (RMS)
REMOVE ALL BURRS / CHAMFER
BREAK SHARP CORNERS .015 ±.005
DO NOT SCALE

| | |
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| No. | REVISION |
|  <p>JETTING SYSTEMS & ACCESSORIES, INC. 4026 TREY HOUSTON, TEXAS 77084 ROTARY LINE CLEANER</p> | |
| END | ADJ. |
| DRW BY | ADJ. |
| SCALE | N.T.S. |
| DATE | 06/21/00 |
| SHEET | 1 OF 1 |
| REV. | 0 |

PINCH ROLLER ASSEMBLY - 10K

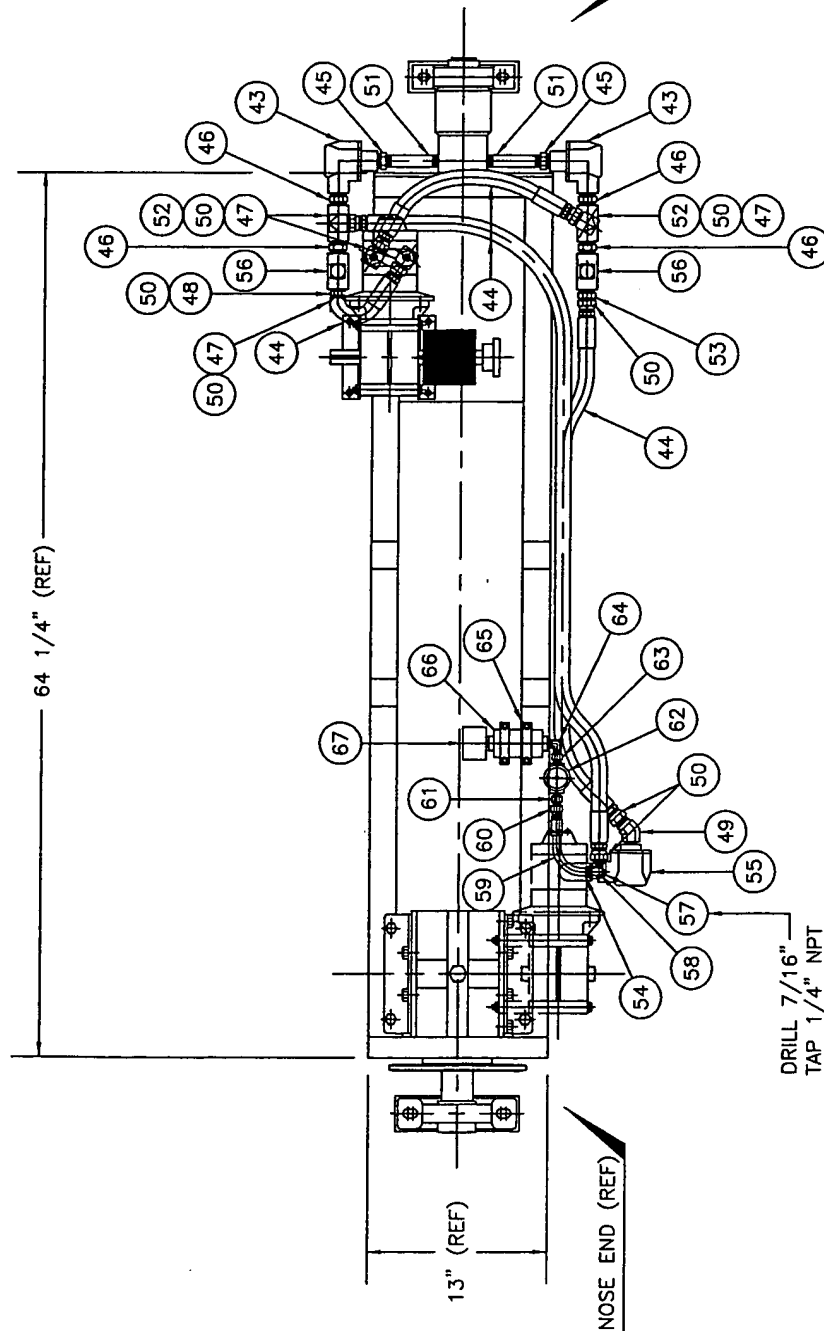
PNCH7510

ACQ NAME


LCR.PNCH7510

Bill Of Materials

| ITEM | QTY | PART NO. | DESCRIPTION | WGT. |
|------|-----|-----------|----------------------------------|------|
| 43 | 2 | GRQE5000 | QUICK EXHAUST VALVE 3/4" NPT | |
| 44 | 4 | HOSE0750 | HOSE 3/4" ID HYD/AIR USE | |
| 45 | 2 | PIB1208PS | PIPE BUSHING 3/4" x 1/2" PLATED | |
| 46 | 4 | PH12PH00 | HEX NIPPLE 3/4" NPT PLATED | |
| 47 | 2 | JP12129X | ADP 3/4" NPT x 3/4" JIC 90° | |
| 48 | 1 | JP121290 | ADP 3/4" NPT x 3/4" JIC 90° | |
| 49 | 1 | JP081245 | ADP 1/2" NPT x 3/4" JIC 45° | |
| 50 | 8 | HE12121H | HOSE FTG 3/4" JIC x 3/4" HOSE | |
| 51 | 2 | PN08FD40 | NIPPLE 1/2" NPT x 4" SCH 40 | |
| 52 | 2 | PT12PS00 | PIPE TEE 3/4" NPT PLATED STEEL | |
| 53 | 1 | JP121200 | ADP 3/4" NPT x 3/4" JIC | |
| 54 | 1 | PN08F0LS | HEX NIPPLE 1/2" NPT x CLS | |
| 55 | 1 | GRQE4000 | QUICK EXHAUST VALVE 1/2" NPT | |
| 56 | 2 | VLVADJ12 | ADJUSTABLE/METERING VALVE 3/4" | |
| 57 | 1 | JP081290 | ELL 1/2" NPT x 3/4" JIC 90° | |
| 58 | 1 | HE02P04H | HOSE FTG 1/8" NPT x 1/4" HOSE | |
| 59 | 1 | HOSE0250 | HOSE 1/4" ID HYD/AIR USE | |
| 60 | 1 | HE04P04H | HOSE FTG 1/4" NPT x 1/4" HOSE | |
| 61 | 1 | JP04802F | BULKHEAD ADP 1/4" JIC x 1/8" NPT | |
| 62 | 1 | GRRG0200 | REGULATOR 1/8" NPT | |
| 63 | 1 | PH02BHEX | HEX NIPPLE 1/8" NPT BRASS | |
| 64 | 1 | PL02PS90 | STREET ELL 1/8" NPT PLATED 90° | |
| 65 | 1 | RLC00084 | MOUNTING BRACKET-DRUM BRAKE | |
| 66 | 1 | RLC00086 | AIR CYLINDER 1 1/2" BORE | |
| 67 | 1 | RLC00085 | DRAG BRAKE-DRUM BRAKE | |



SWIVEL END (REF)

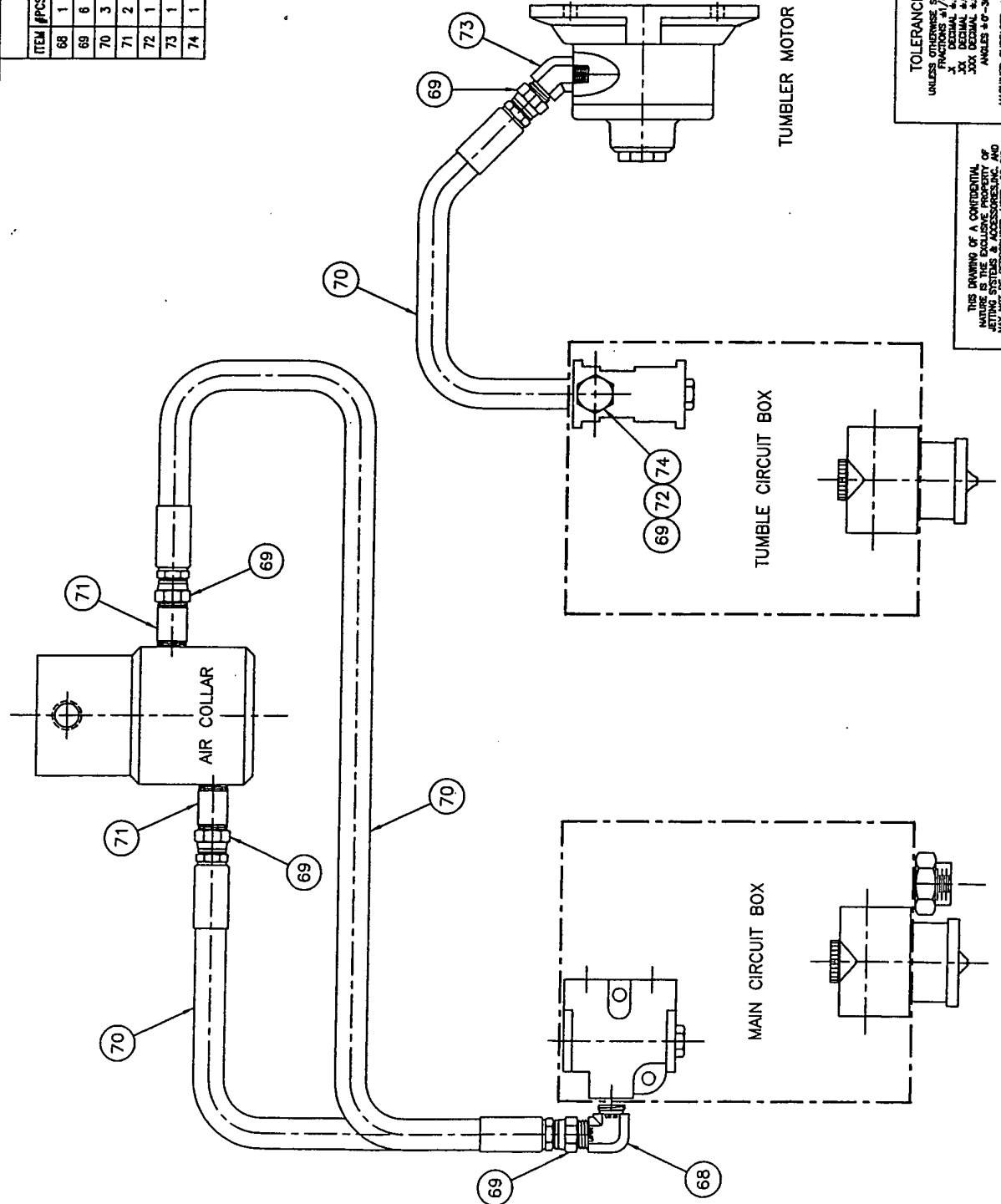
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|---|---------------|-------------|
| No. | REVISION | DATE |
|  JSA JETTING SYSTEMS & ACCESSORIES, INC. 4026 TREY HOUSTON, TEXAS 77084 | | |
| PNEUMATIC ASSEMBLY - 10K RLC | | |
| ENC. 427. | ISSUING NO. | PNMT7510 |
| FORM BY: RLF. | SCALE: N.T.S. | REV. 0 |
| DATE: 02/04/00 | | SHT. 2 OF 3 |

TOLERANCES
 UNLESS OTHERWISE SPECIFIED
 X. FRACTIONAL ±.005
 XX. DECIMAL ±.003
 XXX. DECIMAL ±.020
 JOINTS TYPICAL ±.005
 ANGLES 30°-30°
 MACHINED SURFACES (R) (RMS)
 REMOVE ALL BURRS AND
 BREAK SHARP EDGES TO ±.005
 DO NOT SCALE

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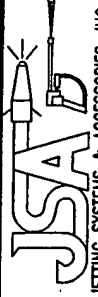
Bill Of Materials

| ITEM # | QTY | PART NO. | DESCRIPTION | WGT. |
|--------|-----|----------|--------------------------------|------|
| 68 | 1 | JP080890 | ADP 1/2" NPT X 1/2" JIC 90° | |
| 69 | 6 | HE08P08H | HOSE FTG 1/2" NPT X 1/2" HOSE | |
| 70 | 3 | HOSE0500 | HOSE 1/2" ID HYD/AIR USE | |
| 71 | 2 | PN08F020 | NIPPLE 1/2" NPT X 2" SCH 40 | |
| 72 | 1 | JP08080F | ADP 1/2" NPT (F) X 1/2" JIC | |
| 73 | 1 | JP040845 | ADP 1/4" NPT X 1/2" JIC 45° | |
| 74 | 1 | PN08F045 | NIPPLE 1/2" NPT X CLOSE SCH 40 | |



TOLERANCES
 UNLESS OTHERWISE SPECIFIED
 FRACTIONS 1/16
 DECIMAL .000
 ANGLES 1/2°-30°
 UNLESS OTHERWISE SPECIFIED
 MACHINED SURFACES .005 (RMS)
 REMOVE ALL BURRS
 BREAK SHARP CORNERS .015
 DO NOT SCALE

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| PNEUMATIC ASSEMBLY - 10K RLC | | |
| DES. J.D.F. DRAWN BY: R.J.F. SCALE: N.T.S. DATE: 06/04/00 | DRAWING NO. PNMT7510 | REV. 0 |

LCR.PNMT75103
 SHEET 3 OF 3

Bill Of Materials

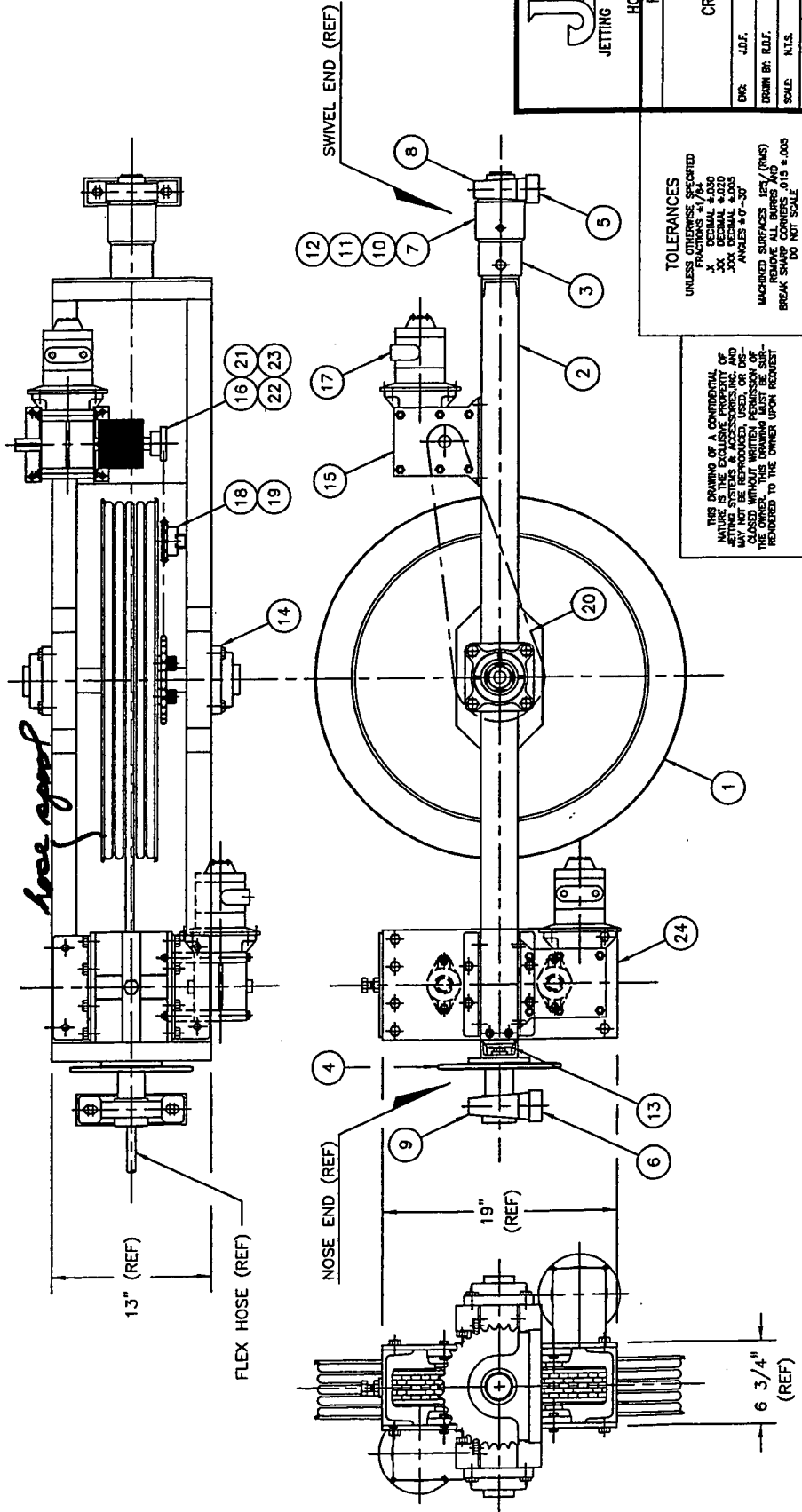
| ITEM | QTY | PART NO. | DESCRIPTION | WGT. |
|------|-----|----------|----------------------------|-------|
| 1 | 1 | DRUM7510 | ASSEMBLY 10K HOSE REEL | 108.5 |
| 2 | 1 | CRDL6413 | CRADLE WELDMENT | 78.7 |
| 3 | 1 | RLC00100 | DUAL PORT SWIVEL | 14 |
| 4 | 1 | RLC00057 | CRADLE DRIVE SPROCKET | 8.5 |
| 5 | 1 | RLC00045 | BEARING MOUNT - INLET | |
| 6 | 1 | RLC00046 | BEARING MOUNT - NOSE | |
| 7 | 1 | RLC00001 | SWIVEL AIR COLLAR | 6.0 |
| 8 | 1 | PLBL1750 | PILLOW BLOCK BEARING 1 3/4 | 4.0 |

Bill Of Materials

| ITEM | QTY | PART NO. | DESCRIPTION | WGT. |
|------|-----|----------|-----------------------------|------|
| 9 | 1 | PLBL2187 | PILLOW BLOCK BEARING 2 3/16 | 5.0 |
| 10 | 1 | RLC00073 | PNEUMATIC SWIVEL WASHER | |
| 11 | 3 | ORB90334 | O-RING 334 Buna 90 DURA-PAK | |
| 12 | 4 | BUB90334 | BACK-UP RING 334 Buna 90 | |
| 13 | 1 | RLC00063 | HOSE GUIDE | |
| 14 | 2 | FLN41937 | FLANGE BEARING 1 15/16" | |
| 15 | 1 | RLC00119 | GEARBOX MODIFICATION | |
| 16 | 1 | SP60BS10 | SPROCKET 60BS10 | |

Bill Of Materials

| ITEM | QTY | PART NO. | DESCRIPTION | WGT. |
|------|-----|----------|-----------------------------|------|
| 17 | 1 | AMGSTEAM | AIR MOTOR GAST 6AM | |
| 18 | 1 | CHNTIGHT | CHAIN TIGHTNER | |
| 19 | 1 | SP60ID13 | IDLER SPROCKET #60 | |
| 20 | 1 | CHN00060 | CHAIN #60 | |
| 21 | 1 | CLTCH16B | CLUTCH 1" BALL BEARING TYPE | |
| 22 | 1 | RLC00081 | RETAINER-DRUM CLUTCH | |
| 23 | 1 | RLC00082 | SPROCKET SHAFT-DRUM CLUTCH | |
| 24 | 1 | PNCH7510 | PINCH ROLLER ASSEMBLY | |



JSA
 JETTING SYSTEMS & ACCESSORIES, INC.
 4008 TREY
 HOUSTON, TEXAS 77084
 ROTARY LINE CLEANER

TOLERANCES
 UNLESS OTHERWISE SPECIFIED
 FRACTIONS ±1/64
 DECIMAL ±.030
 ANGLES ±.030
 HOLE DIA. ±.030
 SHAFT DIA. ±.030
 ANGLES ±.030
 UNLESS OTHERWISE SPECIFIED
 MACHINED SURFACES (25 / RMS)
 REMOVE ALL BURRS AND
 BREAK SHARP CORNERS .015 ±.005
 DO NOT SCALE

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 REV. 0